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APPRENTICESHIP TRAINING

BRICKLAYER Program

Alberta
MANPOWER
Apprenticeship and Trade Certification

DDN 6719079.

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BRICKLAYER TRADE

THE GOAL OF APPRENTICESHIP TRAINING

To develop a competent tradesman who, through skill and knowledge, is capable of building all types of masonry structures.

THE PRODUCT OF APPRENTICESHIP — a graduate who is able to:

★ Understand the principles of sound and safe construction.

★ Know the characteristics and proper use of masonry materials.

★ Interpret plans and specifications and to layout and develop projects accordingly.

★ Calculate material quantities.

★ Use hand tools and powered equipment in a proper and safe manner.

★ Construct masonry wall or units that act as a base for other finished materials or remain as a sound and pleasing finished product.

★ Relate to the work of other tradesmen in the building industry.

★ Perform assigned tasks in accordance with quality and production standards required in industry.

BRICKLAYER APPRENTICESHIP INFORMATION

Basic Requirements:

★ Indenture for three periods of Trade experience.

★ Attend a 12 week technical training course in the first period and a 6 week technical training course in both the second and third periods.

★ Fulfill the requirements for each period including 1600 hours of work experience excluding time spent at the training course; successfully complete the technical training course and obtain a satisfactory employer's report.

★ Education — a minimum requirement is the completion of grade 9 or a pass on an equivalent entrance examination as prescribed by the Trade regulations.

★ Age — the minimum age for apprentices is 16 years. There is no upper age limit.

Credits:

★ Accelerated patterns of apprenticeship may be granted for related technical training and/or experience.

Benefits:

★ Apprenticeship is a learning-while-earning program. While working at the trade during apprenticeship, apprentices are assured by regulation of a minimum percentage of the journeyman rate: 50% during the first period, 80% during the second period, 90% during the third period. Progress from one rate to the next takes place only after successful completion of all the requirements for each period.

★ All apprentices 17 years of age and older are normally eligible for training allowances while attending technical training courses. These allowances are funded by the Canada Employment and Immigration Commission.

★ Administrative procedures establishing the amount of training allowance is complex and can vary with an individual's circumstances. Contact a local Canada Employment Centre for details.

★ An apprentice who successfully completes the program will graduate with an Alberta Completion of Apprenticeship Certificate, and an Alberta Certicate of Qualification with Interprovincial Red Seal.

★ The most significant benefit to the graduate apprentice is that he is well trained in technical and practical aspects of the trade and is able to make a worthwhile and productive contribution to society. Society in return, will provide an opportunity for an above-average income and successful livelihood.

DIRECTIONS FOR PROSPECTIVE APPRENTICES

★ Contact your nearest Apprenticeship and Trade Certification office for detailed information and counselling (see list of offices on page 23).

★ Obtain an application form from the Apprenticeship and Trade Certification office and neatly complete, in full, the information requested of the apprentice.

★ Contact in person firms that employ Bricklayers and apply for an apprentice position. Present your apprentice appltion forms to the person who interviews you so that he will know who you are and what you can offer his firm.

★ Persevere in the search for apprentice employment and upon obtaining employment, leave the application with the employer.

★ Attach to the apprentice application a copy (transcript) of the marks for your last year of school. Applicants who do not have their school transcripts or a grade 9 standing are required to write an entrance examination. If transcripts have been lost, contact Alberta Education for information on school transcripts.

★ Any time credit, for previous experience in the Bricklayer trade, should be discussed with the employer and requested on the application form by the employer.

★ A contract of apprenticeship is entered into between the apprentice and the employer and should be signed within three months after the apprentice application has been approved. If contracts have not been issued within this time, contact the Apprenticeship and Trade Certification office.

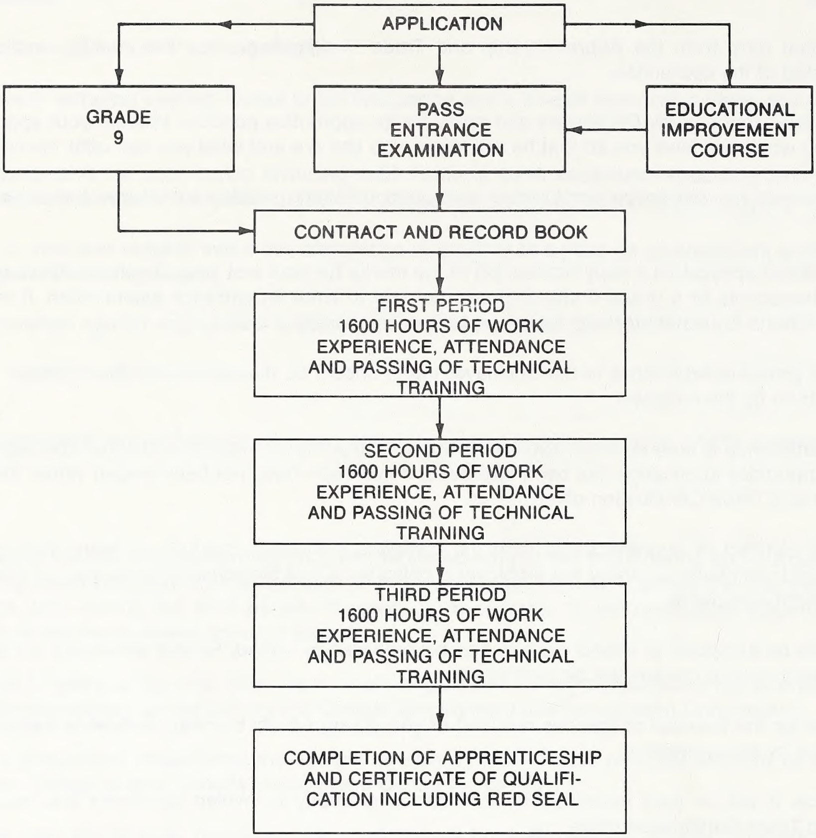
★ Before signing the contract of apprenticeship read the complete document carefully — know your obligations and responsibilities to your employer — know the employer's obligations and responsibilities to you — feel confident you have selected the right occupation.

★ Know when you will be expected to attend classes and be prepared to attend. School schedules will be sent to your employer and notice to attend classes will be sent to you.

★ Prepare in advance for the financial obligations required of you during school training. Reference materials and school supplies are paid for by the apprentice.

★ While an apprentice, it will be your responsibility to respond promptly to mailed directions and requests from the Apprenticeship and Trade Certification office.

APPRENTICESHIP ROUTE TOWARD CERTIFICATION


APPLICATION
GRADE 9
PASS ENTRANCE EXAMINATION
EDUCATIONAL IMPROVEMENT COURSE
CONTRACT AND RECORD BOOK
FIRST PERIOD 1600 HOURS OF WORK EXPERIENCE, ATTENDANCE AND PASSING OF TECHNICAL TRAINING
SECOND PERIOD 1600 HOURS OF WORK EXPERIENCE, ATTENDANCE AND PASSING OF TECHNICAL TRAINING
THIRD PERIOD 1600 HOURS OF WORK EXPERIENCE, ATTENDANCE AND PASSING OF TECHNICAL TRAINING
COMPLETION OF APPRENTICESHIP AND CERTIFICATE OF QUALIFICATION INCLUDING RED SEAL

APPRENTICESHIP COMMITTEE STRUCTURE

Bricklayer Provincial Apprenticeship Committee

The Provincial Apprenticeship Committee for the Bricklayer Trade is comprised of members from Local Apprenticeship Committees from the cities of Edmonton, Calgary and Lethbridge.

This Committee is concerned with the policies that guide the program and make recommendations to the Apprenticeship and Trade Certification Board and the Executive Director of the Apprenticeship and Trade Certification office in the following areas:

- ★ Contribute current information relative to changes in the trade and requirements of industry.
- ★ Make recommendations for changes to existing trade regulations.
- ★ Assist in updating of the training program through recommendations for revisions to the course outline and attendant examinations.

Bricklayer Local Apprenticeship Committee

Local Apprenticeship Committees are concerned with individuals and trade situations within a local region. Meetings are held throughout the year to make recommendations and to discuss problems relating to the apprenticeship program. Members who serve on committees are nominated by employer and labour organizations, and membership is equally divided into employer and employee representation in accordance with The Manpower Development Act.

Apprenticeship Committee Members:

Mr. J. Cisakowski — Edmonton — Employer
Mr. C. Schmidt — Edmonton — Employee
Mr. F. Stromberg — Edmonton — Employee
Mr. G. Thomas — Edmonton — Employee (Alternate)
Mr. J. Boeckx — Calgary — Employer
Mr. H. Jorgensen — Calgary — Employer
Mr. G. Nitsch — Calgary — Employee
Mr. K. Wishart — Calgary — Employee
Mr. W. Kjelstrom — Calgary — Employee (Alternate)
Mr. K. Grimm — Calgary — Employer (Alternate)

BRICKLAYER PROGRAM
COURSE OUTLINE

This outline has been prepared in accordance with recommendations from the Provincial Apprenticeship Committee for the Bricklayer Trade in the Province of Alberta and approved by the Apprenticeship and Trade Certification Board.

The outline was updated following consideration given to recommendations and suggestions from:

Local Apprenticeship Committees
Representatives from training institutes
Curriculum Sub-Committee from the Provincial Apprenticeship Committee

PROCEDURES FOR RECOMMENDING REVISION(S) TO THE COURSE OUTLINE

Any concerned citizen or group in the Province of Alberta may make recommendations for change by writing to Apprenticeship and Trade Certification, Edmonton.

It is requested that recommendations for change refer to specific areas and state references used. Recommendations received will be placed before regular meetings of the Provincial Apprenticeship Committee.

SAFETY EDUCATION

Safe working procedures and conditions, accident prevention and the preservation of health is of primary importance in the Apprenticeship programs in Alberta. These responsibilities are shared and require the joint efforts of the government, employers, employees and the general public. Therefore, it is imperative that all parties become aware of circumstances that may lead to injury or harm and that safe learning experiences and environment can be created by controlling the variables and behaviors that may contribute to or cause an accident and/or an injury.

It is generally recognized that a safe attitude contributes to an accident free environment. As a result a healthy safe attitude towards accidents will benefit an employee by helping to avoid injury, loss of time and loss of pay.

A tradesman is possibly exposed to more hazards than any other person in the work force and therefore, should be familiar with the Occupational Health and Safety Act and Regulations dealing with his own personal safety and the special safety rules applying to each job.

LEGAL AND ADMINISTRATIVE ASPECTS

Employer's Responsibilities:

Accident prevention and the provisions of safe working conditions are the responsibilities of an employer. The company is responsible for:

1. The provision and maintenance of safety equipment
2. The provision of protective devices and clothing (as required by the Occupational Health & Safety Act, General Safety Regulations)
3. The enforcement of safe working procedures
4. Adequate safeguards for machinery, equipment and tools
5. Observance of all accident prevention regulations
6. Adequate training to allow a worker to use or operate equipment in an effective and safe manner.

Government's Responsibilities:

Apprenticeship and Trade Certification in conjunction with the respective Provincial Apprenticeship Committee assumes the responsibility to assure that adequate safety is reflected in the curriculum and that adequate safety instruction is presented at the training establishments.

The Occupational Health and Safety Inspection Branch assumes the responsibility for periodic inspection of the operation to ensure that regulations for industry are being correctly observed.

Individual's Responsibilities:

The employee is responsible for:

1. Knowing and working in accordance with the safety regulations pertaining to job environment and
2. Working in such a way as not to endanger himself or his fellow employees

The major factor in safety is the individual employee, his personal attitude toward safety and having an awareness of the respective safety regulation.

PREFACE

The lectures, demonstrations and assignments outlined herein, are intended to familiarize and to prepare the apprentice for the performance of his occupation within the Bricklayer trade. To cope with present day requirements and to become able to adjust to situations that will arise apart from nominal work experience during apprenticeship, it is accepted that the apprentice should appreciate and develop skills within the scope of the trade.

★ Instruction in trade matters often lends to both shop and theory situations, and this outline does not define precise divisions.

★ The emphasis or hours allocated for shop and related instruction is specified in the preface or objectives for each school term.

★ With respect to related subjects (blueprint-shop drawing; mathematics, etc.) it is accepted that knowledge of these areas is important for the tradesman. It is specified that all matters reflect the Bricklayer trade and that the depth of instruction relate to the needs of the journeyman.

International System of Unity (SI METRIC)

The requirements of industry to meet a need to construct products using the SI method of measurement require the preparation of apprentices to include SI knowledge. Technical training therefore should include theoretical and practical instruction to enable apprentices to perform adequately in this system.

Occupational Health and Safety Regulations

The relationship between these regulations and safety will be observed throughout the program.

BRICKLAYER PROGRAM

Subjects and Time Distribution

First Period	**12 Weeks**	**30 Hours Per Week**	**360 Hours**
Section One:	Theory		44
Section Two:	Shop		280
Section Three:	Shop Drawing		18
Section Four:	Trade Mathematics		18
Second Period	**6 Weeks**	**30 Hours Per Week**	**180 Hours**
Section One:	Theory		48
Section Two:	Shop		90
Section Three:	Shop Drawing		24
Section Four:	Trade Mathematics		18
Third Period	**6 Weeks**	**30 Hours Per Week**	**180 Hours**
Section One:	Theory		42
Section Two:	Shop		90
Section Three:	Shop Drawing		30
Section Four:	Trade Mathematics		18

FIRST PERIOD TECHNICAL TRAINING
COURSE OUTLINE

SECTION ONE: **THEORY** **44 Hours**

TOPIC

COURSE OBJECTIVES

Upon successful completion of each section the apprentice should be able to:

A. Introduction to the Trade

1. Quote a general history of the trade.
2. Describe the scope of the trade.
3. List the regulatory bodies that govern the trade.

B. Tools and Equipment

1. List the hand tools generally used by a Bricklayer.
2. Describe the care cleaning and maintenance of of personal tools.
3. Describe the equipment used to:
   - (a) mix mortar
   - (b) handle material
   - (c) cut masonry
4. List the responsibilities of the employer and employee to supply and maintain tools and equipment.
5. Describe safety rules that apply to tools and equipment.

C. Masonry Materials

1. Describe the basic manufacture of masonry modules.
2. List the modular sizes and mass of commonly used masonry units.
3. Recognize special shapes and sizes of masonry units.
4. Describe the nominal and actual dimensions of commonly used units.
5. Describe the characteristics of:
   - (a) solid and hollow units
   - (b) colours and textures in masonry
   - (c) compressive and transverse strengths of masonry
   - (d) wetting and absorption factors of masonry units
   - (e) structural and aesthetic qualities of masonry
6. Describe the specifications, testing and inspections used to control the quality of masonry units.
7. Describe the conditioning and use of salvaged brick.

D. Mortars and Grout

1. Describe the make up of mortars for various uses including:
   - (a) cementitious materials
   - (b) aggregates
   - (c) additives and admixtures
2. List the characteristics and properties of various mortars including:
   - (a) strength
   - (b) durability
   - (c) water retention
3. Describe mixing and batch control of mortars, including:
   - (a) specifications
   - (b) consistency
   - (c) plasticity
   - (d) mixing time
   - (e) effects of impurities
   - (f) board life
4. Describe considerations that must be given to hot and cold weather construction.

TOPIC

COURSE OBJECTIVES

5. List the uses of grout in the bricklaying trade including:
   - (a) aggregates
   - (b) consistencies
   - (c) high and low lifts
   - (d) mixing proportions

E. Wall Systems

1. Describe wall types used above and below grade including:
   - (a) foundation walls
   - (b) interior walls
   - (c) exterior walls
   - (d) solid masonry
   - (e) cavity walls
   - (f) veneers
   - (g) reinforced masonry (R.G.M.) walls

F. General Knowledge

1. Describe the common stains and the methods and cleaning agents used for removal.
2. Describe the reasons for, and methods used to point masonry including:
   - (a) removal of old mortar
   - (b) preparation of mortar
   - (c) application of mortar
   - (d) finishing of joints
   - (e) cleaning
3. Describe the use of caulking including:
   - (a) surface preparation
   - (b) material selection
   - (c) application
4. Describe the reasons for parging including:
   - (a) surface preparation
   - (b) material mixing
   - (c) application
5. Describe the basic theory of insulation including:
   - (a) heat loss and transfer
   - (b) R values
   - (c) rigid and semi rigid insulation
   - (d) applications
   - (e) acoustic and fire ratings
6. Describe the theory and purpose of vapour barriers including materials and applications.
7. Describe the principles of damp proofing and water proofing including materials and applications.
8. Describe the principles of air sealed buildings including methods and applications.
9. Describe the purpose of flashing in the trade and list the advantages and disadvantages of various materials including:
   - (a) plastics
   - (b) metal
   - (c) laminated
   - (d) rubber (vinyl)

G. Occupational Health and Safety

1. Regulations

1. Identify the safety regulations as they apply to the safe working practices in the bricklaying trade in particular, and in construction generally with emphasis on:
   - (a) general safety precaution
   - (b) housekeeping
   - (c) personal protective equipment and clothing
   - (d) safety belts life lines and safety nets
   - (e) respiratory protective equipment

TOPIC — COURSE OBJECTIVES

  - (f) construction ladders
  - (g) protection form falling materials
  - (h) chimney hoists
  - (i) scaffolds for bricklayer
  - (j) ramps runways and stairways
  - (k) rolling scaffolds
  - (l) suspended and swing scaffolds
  - (m) perimeter guard rails

2. Identify fires by class and list extinguisher used for each class.
3. List critical fire hazard area in construction.

2. Explosive Actuated Tools Course

1. Describe and define high velocity and low velocity tools and their operation. Be aware of the safety features and the different types of fasteners and charges. Learn the safety codes and regulations. State causes of misfire.
2. Identify the operator's responsibility. Demonstrate safe operation. Explain the relationships between pins, charges and materials. Discuss the hidden features of fastening surfaces.
3. Demonstrate servicing and safe storage of tools and supplies. Demonstrate minimum service of all common tools. Learn proper and safe storage of tools and charges and the disposal of misfired charges.
4. Demonstrate operation and the actual firing of a high velocity and a low velocity tools.
5. Operate — take part in both the prefiring routine and fire both high high velocity and low velocity explosive actuated type.
6. Confirm Proficiency by examination.

H. Refractory Systems

1. Describe the properties, sizes, and shapes of fire brick.
2. List the joints and form work techniques used for fire brick.
3. Describe the installation of refractory in rotary kilns.
4. Describe acid brick work.
5. List the property of mortar used in refractory work.
6. Describe the use of castable refractory.
7. Describe the use of ceramic fibre including anchoring and application.
8. Explain the purpose of heat up and cooling schedules for refractory materials.
9. List common causes of deterioration of refractory materials.

SECTION TWO: SHOP 280 Hours

A. Tools and Equipment

1. Identify and demonstrate skill in the use and care of hand tools common to the trade.
2. Operate a masonary saw in a safe and efficient manner.

B. Mortars

1. Proportion and mix mortars with power mixer and by hand.
2. Demonstrate an ability to spread and butter mortar including:
   - (a) bed joints
   - (b) cross joints
   - (c) collar joints

TOPIC COURSE OBJECTIVES

C. Wall Construction

1. Layout and construct in a manner commiserate with good trade practices including the following cavity walls, veneered walls, solid walls, intersecting walls and composite walls constructed of clay and concrete masonry incorporating:
   (a) openings
   (b) pilasters
   (c) control joints
   (d) chases
   (e) bond beams
   (f) lintels
   (g) anchoring frames
   (h) electrical boxes and conduit
   (i) plumbing pipes
   (j) reinforcing rods
   (k) wall anchors for cavity walls, veneer on wood and metal framing and poured concrete
   (l) running bond
   (m) common bond
   (n) English bond
   (o) flemish bond
   (p) stack bond
   (q) gauge rods
   (r) flashing and damp proofing
2. Clean masonry using acceptable solutions and techniques.
3. Tool and point joints.
4. Prepare and caulk joints.

D. Scaffold

1. Erect, work from and dismantle scaffolding in a safe and efficient manner.

SECTION THREE: SHOP DRAWING 18 Hours

A. Shop Drawing

1. Identify the following lines:
   (a) object
   (b) extension
   (c) centre
   (d) hidden
   (e) break
   (f) dimension
2. Draw basic shop drawing using drawing instruments, T square, set squares and architect scale rule, including:
   (a) basic orthographic and isometric presentations
   (b) plan and elevation views for shop projects
   (c) numbers and upper case letters commonly used in shop drawings
3. Sketch freehand simple drawings of shop projects including symbols commonly used in construction.

B. Blueprint Interpretation

1. Using residential and light commercial blueprints:
   (a) identify plan, elevation and detail views
   (b) locate openings, joints, bond beams and reinforcements
   (c) find dimension
   (d) isolate brick items
   (e) calculate masonry material
   (f) show consideration for the responsbilities of other trades

TOPIC	COURSE OBJECTIVES
SECTION FOUR:	**18 Hours**
A. Calculation Related to the Trade	1. Calculate linear measurements, areas and volumes of geometric shapes. 2. Calculate area and circumference of circles. 3. Calculate the hypotenuse of right triangles (3-4-5). 4. Calculate ratios and percentages.

SECOND PERIOD TECHNICAL TRAINING

SECTION ONE: **THEORY** **48 Hours**

TOPIC	COURSE OBJECTIVES
	Upon successful completion of each section the apprentice should be able to:
A. Selection Review of First Period Training	
	1. Display the skills and knowledge taught in first period.
B. Concrete	
1. Use within the trade	1. Describe the use of concrete in the bricklaying trade.
2. Composition of cements and use of additives.	1. List the ingredients and use of Portland cements commonly used in the trade. 2. List the purpose, advantages and disadvantages of additives in concrete including: (a) accelerators (b) retarders (c) air entraining agents (d) coloring (e) plasticizers (f) hardeners
3. Aggregates	1. Explain reasons for the gradation of aggregates. 2. Identify the tests performed in the laboratory and the field for: (a) moisture and bulking (b) organic content (c) fineness modulus 3. Describe the purpose of special light weight aggregates used in the trade.
4. Concrete design	1. Describe the typical range of concrete strengths used in the trade. 2. Explain batching by mass and volume with emphasis on: (a) water cement ratio (b) paste to aggregate ratio (c) slump (d) additives (e) design tables 3. Describe the procedure followed to mix concrete on site: (a) by hand (b) with mechanical mixer
5. Curing	1. Explain hydration process. 2. Describe the necessary consideration for curing in hot and cold weather.
6. Placing	1. Describe placement of concrete in high and low lifts including: (a) chutes (b) consolidation (c) pumps (d) trunks
7. Test	1. Describe the procedure followed to take comprisive and sump tests.
C. Reinforced Masonry	
1. Principles of reinforced masonry.	1. Describe the types of structures including: (a) bonding systems (b) masonry units (c) mortars
2. Reinforcements	1. Describe the gauges and sizes of reinforcing steel. 2. Describe the accessories used in reinforce masonry including: (a) ties (b) stirrups

TOPIC	COURSE OBJECTIVES
	(c) anchors (d) inserts (e) chairs
3. Placement of reinforcing steel	1. List the special requirements for reinforcing steel.
	2. Describe the minimum clearances and concrete cover for steel.
4. Stresses in masonry	1. List the natural and build in forces in masonry including: (a) live loads (b) dead loads (c) compression (d) tension (e) shear (f) racking
	2. Describe how the forces in masonry construction are counteracted by: (a) reinforcing steel (b) buttresses (c) pilasters (d) shear walls (e) floor and roof assemblies (f) bond beams and lintels (g) plumb and aligned loads (h) anchors and ties
5. Moisture control	1. Describe the methods used to control moisture in masonry walls including: (a) flashing (b) caulking (c) weep holes
	2. Explain purpose and types of control joints used in masonry.
D. Chimneys and Fireplaces	
1. Chimneys	1. List the types of masonry chimneys used in: (a) industrial plants (b) commercial building (c) residential building
	2. Describe the principles of chimney design including: (a) material used (b) flue installation (c) flashing details (d) Canadian Standard Association Codes (e) National Building Code
2. Fireplace	1. Describe single face, two face adjacent and two face opposite fireplaces.
	2. Describe the purpose of: (a) fire box (b) inner and outer hearth (c) throat (d) smoke chamber (e) smoke shelve (f) flue liners (g) dampers
	3. List the types of masonry units and mortars in fireplace construction.
	4. Describe the bonds and patterns used on fireplace exteriors.
	5. Describe the standards that apply to: (a) clearance from structural members (b) anchoring (c) multiple flues (d) cleanouts and ash pits (e) clearance from roof lines (f) flashing systems
	6. Describe consideration given to fireplaces that are: (a) flush with walls (b) projecting into rooms

TOPIC	COURSE OBJECTIVES
	(c) hearth and mantel types (d) patterns and bonds
	7. Describe special consideration for new fireplaces in old structures.
	8. Describe consideration for combustion air in fireplaces.
E. Arches	
	1. Describe the following arches and the lay procedure: (a) flat (b) semicircular (Roman) (c) segmental (d) elliptical
	2. List typical usage of arches in industry.
F. Stone Masonry	
1. Types	1. List the types and classifications of stone commonly used in the trade.
2. Mortar	1. Describe the mortar used with stone including: (a) coloured (b) nonstaining (c) dry pack systems (d) cleaning and pointing
3. Installation	1. Describe the aesthetic layout of stone.
	2. Describe the special consideration for: (a) cutting and trimming (b) lifting and handling (c) wedges and spacers (d) anchoring and bonding
	3. Describe the setting and bonding of sills and copings.
G. Prefabricated Masonry	
	1. Describe the scope and use of prefabricated masonry in the industry including advantages and disadvantages.
	2. List the materials used including: (a) units (b) mortars (c) admixtures (d) reinforcing
	3. Describe the fabricating and placing procedures including: (a) critical mortar design (b) curing and cleaning (c) lifting and placing (d) anchoring
H. Miscellaneous Masonry	
1. Paving brick	1. Explain the design and construction principles of: (a) pavement brick (b) steps (c) patios
2. Overlays	1. Describe the use of brick slices as overlays.
3. Decorative masonry	1. Describe the following patterns: (a) herringbone (b) basket weave (c) rowlock courses (d) soldier courses

TOPIC

COURSE OBJECTIVES

SECTION TWO: SHOP 90 Hours

A. Fireplace and Chimney Construction

1. Chimneys

1. Construct single flue chimneys with emphasis on:
    - (a) base (footings)
    - (b) layout and alignment
    - (c) clean outs
    - (d) flue linings
    - (e) flashings
    - (f) capping

2. Fireplace

2. Build basic fireplaces with emphasis on:
    - (a) fire box
    - (b) smoke chamber
    - (c) inner hearth
    - (d) flues
    - (e) throat

B. Reinforced Masonry

1. Layout and construct reinforced masonry walls from given specifications including:
    - (a) piers
    - (b) pilasters
    - (c) bond beams
    - (d) lintels
    - (e) openings
    - (f) grout space
    - (g) clean outs
    - (h) controls joints
    - (i) reinforcing wires and ties
    - (j) horizontal and vertical rebar
    - (k) pointing and cleaning

C. Arches

1. Layout and build templates, to specification and construct:
    - (a) flat arch
    - (b) semicircular arch
    - (c) segmental arch
    - (d) jack arch soffits

D. Stone Masonry

1. Construct projects of quarried and/or field stone in:
    - (a) random and coursed ashlar
    - (b) squared and random rubber with emphasis on:
        - (i) aesthetics
        - (ii) trimming and cutting
        - (iii) mortars colored and non-standing

2. Set caps and copings.

E. Miscellaneous Masonry

1. Curved and circular walls and steps

1. Layout and construct curved and circular structures and steps.

2. Decorative masonry

1. Incorporate the following into projects:
    - (a) herringbone and basket weave patterns
    - (b) rowlock and soldier courses

SECTION THREE: SHOP DRAWING AND BLUEPRINT READING 24 Hours

A. Shop Drawing

1. Amplify drawings with notes.

2. Make freehand pictorial drawings to clarify details and notes from building plans.

TOPIC	COURSE OBJECTIVES	
	3. Make drawings to specifications for shop projects.	
B. Blueprint Reading	1. Display expertise in interpreting blueprints for commercial buildings including: (a) site plans (b) structural plans (c) mechanical plans (d) architectural plans 2. Display expertise in interpreting specifications as they apply to the trade.	
SECTION FOUR:	**TRADE MATHEMATICS**	**18 Hours**
A. Trade Mathematics		
1. Calculations	1. Calculate area and perimeters of circular, rectangular and irregular shapes as they apply to layout and material take offs. 2. Calculate materials required for various jobs including: (a) masonry units (b) ties and reinforcing (c) mortar and grout (d) concrete (e) waste allows (f) reusable 3. Calculate ratio and proportion as it apply to mortar and concrete mixing design. 4. Calculate elevations from established bench marks including: (a) gauging (b) opening 5. Calculate coursing, gauging and material requirements for batters and slopes.	

THIRD PERIOD TECHNICAL TRAINING

SECTION ONE: THEORY 42 Hours

SUBJECT/TOPIC	COURSE OBJECTIVES Upon successful completion of each section the apprentice should be able to:
A. Selective Review of First and Second Periods	
	1. Display the skills and knowledge taught in first and second periods.
B. Refractory Systems	
1. Perusal of previous refractory	1. Apply the refractory information taught in first period.
2. Masonry units	1. Describe the use of low temperature units.
2. Control joints	1. Describe the purpose and composition of control joints.
4. Mortars	1. Describe the application of mortars used with refractory brick: (a) dip and buttered systems (b) bonding and non bonding
5. Multilayer masonry	1. Describe the methods used and purpose of multilayered refractory construction.
6. Castable systems (a) monolithic pours	1. List the methods used and purpose of monolithic pours.
(b) common materials	1. List the common materials used and their purpose including: (a) high aluminum (b) high density (c) low density
(c) forming	1. Describe the forming materials and procedures.
(d) gunnite	1. List the advantages and limitations of gunnite applications including mixing and equipment.
(e) anchoring and reinforcing	1. Describe anchoring and reinforcing methods including: (a) layout and spacing (b) penetration of anchors for proper bond
(f) placing requirements	1. Describe the placing and consolidation procedures of cast able materials.
7. Plastic Firebrick	1. Describe the methods of application and anchoring systems used for plastic firebrick.
8. Ceramic fibre	1. Describe the methods for application and anchoring.
9. Heatup and cooling	1. Describe the purpose of heatup and cooling schedules including: (a) time factors related to materials and thicknesses (b) steam explosions and other inherent problems
10. Common causes of failure	1. Describe the common causes of deterioration of refractory materials including: (a) chemical action-oxidization (b) expansion and contraction (c) slag attacks
C. Building Layouts	
1. Layout	1. Establish reference points from plans and bench marks. 2. Layout storey rods. 3. Layout openings, pilasters and joints. (a) high density (b) low density 4. Locate and install base flashing and damp proofing.
2. Builder's level	1. Describe the procedures of setup and checking a builder level. 2. Describe the care and maintenance of instruments.

TOPIC	COURSE OBJECTIVES
D. General Masonry	
1. Flexibility of masonry design	1. List and describe the common aesthetic designs including: (a) decorative patterns (b) special design and shapes of units (c) colours of units and mortar (d) the effect of balance and patterns
	2. Describe pattern layout procedures.
	3. Describe cutting and shaping procedures.
2. Stone	1. Describe the setting of precut stone in random and ashlar patterns.
3. Maintenance and repair	1. Describe the causes of deterioration of masonry structures including: (a) efflorescence (b) industrial pollutants (c) freeze-thaw cycles and other forces of nature (d) structural flaws
	2. List the procedures used to: (a) replace units (b) repointing joints (c) installing new flashings (d) recaulking and sealing
4. Cleaning of masonry	1. Display expertise in the methods and agents used to clean masonry.
E. Fireplace Construction	
1. Exteriors	1. Describe in detail the principles of design and aesthetics.
	2. List and apply the applicable codes including: (a) proximities to combustible materials (b) clearance from structural members (c) bearing ledgers and footings (d) mortars (e) clearance above roofs
	3. Describe in detail materials used in construction of fireplace exteriors including: (a) brick, block, stone, and their application above and below grade (b) waterproof below grade (c) bonds and anchors
	4. Describe in detail the procedure used for battering.
	5. Describe in detail types of flashings and methods of installation for chimneys and fireplaces.
2. Interiors	1. Describe in detail the principle of design and aesthetics.
	2. List and apply the applicable codes including: (a) proximities to combustible materials (b) clearance from structural members (c) describe the construction and purpose of hearths and mantels
	3. Describe the methods of construction and purpose of: (a) combustion air supply (b) combustion chambers and refractory units (c) smoke chambers (d) dampers (throat) (e) ash pits (f) flue liners
	4. Describe the necessary requirements for additional combustion chambers and multiple flues.
F. Job Procedures and Practices	
1. Site orientation and preparation	1. Describe the consideration given to and effect of site layout for masonry construction including: (a) provision for material storage and access (b) distribution of masonry modules and how to avoid point loading of the scaffolding and building structure

TOPIC	COURSE OBJECTIVES
	(c) access to power and water (d) area for mixing and the distribution of mortar (e) access to masonry saws by tradesmen (f) flow of material
	2. Describe consideration for scaffolding, hoarding and heat.
	3. List the provisions required for shoring and bracing.

SECTION TWO: SHOP 90 Hours

A. Advanced Masonry

1. Building layout	1. Layout masonry and masonry buildings from blueprints using: (a) builder level (b) tape, lines and plumb bob (c) storey poles and gauge rods
2. Arch construction	1. Layout and construct one, two, three and four center arches including: (a) semi-circular (b) segmental (c) tudor (d) parabolic (e) gothic
3. Prefabricated panels	1. Layout and construct prefabricated panels including the proper use of reinforcing.
4. Load bearing masonry	1. Construct load bearing masonry buildings including shoring and bracing based on plans and specifications.
5. Special Design Masonry	1. Construct: (a) curved masonry planters and walls (b) steps (c) corbelled and battered, masonry project (d) barbeurs (e) feature walls (f) privacy screens
	2. Lay tyndal stone in random or ashlar patterns.

B. Practical Exam

1. Fireplace construction	1. Build a fireplace to specifications and drawings. NOTE: This project will be marked by representatives of industry. The marks awarded will be the major consideration for awarding completion of apprenticeship and journeyman status.

SECTION THREE: SHOP DRAWING 30 Hours

A. Blueprint Reading

1. Specifications	1. Interpret and build to specifications.
2. Site plans and floor plans	1. Establish bench marks and building lines.
3. Architectural plans	1. Layout elevations for openings beams, copyings, etc.
	2. Layout rooms, doors and hallways.
	3. Make allowances for other trades.
4. Masonry details	1. Locate, identify and layout: (a) veneered walls (b) load bearing walls (c) curtain walls (d) beams and lintels (e) placement of reinforcing

TOPIC	COURSE OBJECTIVES
5. Other plans	1. Relate to mechanical and electrical plans as they relate to objects that must be buried in or surrounded by masonry.
6. Schedules	1. Identify building components from such as: (a) room schedule (b) door schedule (c) finish schedule
B. Drawing and Sketching	
1. Sketching	1. Make quick freehand drawing to assist on site layout, communication within the industry and clarify design and procedures to the customer.
2. Drawing	1. Make a set of drawings for the fireplace to be built for the practical examination. 2. Develop working drawings for small projects.

SECTION FOUR: TRADE MATHEMATICS 18 Hours

A. Calculations	
1. Arithmetic	1. Display proficiency in calculating trade problems including: (a) areas (b) volumes (c) perimeters (d) percentages (e) linear measurements (f) ratios (g) course layouts
2. Calculation of loads and distribution of mass	1. Calculate safe loading of scaffolds and floor slabs including safety factors related to material storage and distribution.
3. Material take off	1. Calculate required materials from blueprints.
4. Costing	1. Calculate material and labour including such variables as weather, hoarding and heat.

SUGGESTED REFERENCE MATERIALS

Orthographic Projection Simplified — C. Quinlan — McKnight and McKnight — 2nd Edition

The Bricklayer, Brick and Block Construction — Volumes I, II and III

Masonry Design and Construction for Building — C.S.A. Standard 5304 — 1977

Masonry Construction for Building — C.S.A. Standard A-371

Mortar and Grout for Unit Masonry — C.S.A. Standard A-179—1976

Fireplace Report — Morstead — Alberta Masonry Institute — 2nd Edition

TECHNICAL TRAINING SCHOOLS

The Bricklayer apprenticeship training program is offered by Alberta Manpower, Apprenticeship and Trade Certification office. Staff and facilities for teaching the program are supplied by:

1. Northern Alberta Institute of Technology
2. Southern Alberta Institute of Technology

LOCATION OF APPRENTICESHIP AND TRADE CERTIFICATION REGIONAL OFFICES

BONNYVILLE

CALGARY

EDMONTON

FORT McMURRAY

GRANDE PRAIRIE

HINTON

LETHBRIDGE

MEDICINE HAT

PEACE RIVER

RED DEER

VERMILION

GOVERNMENT OF THE PROVINCE OF ALBERTA
ALBERTA REGULATION 361/79

(Filed November 19, 1979)

THE MANPOWER DEVELOPMENT ACT

DEPARTMENT OF ADVANCED EDUCATION AND MANPOWER

MINISTERIAL ORDER

I, James D. Horsman, Minister of Advanced Education and Manpower, pursuant to sections 30(2) and 37(2) of The Manpower Development Act, hereby make regulations in the Appendix attached hereto, being the Bricklayer Trade Regulation.

Dated at the City of Edmonton, in the Province of Alberta, this 31st day of October, 1979.

JAMES D. HORSMAN,
Minister of Advanced Education
and Manpower.

APPENDIX

THE MANPOWER DEVELOPMENT ACT

Bricklayer Trade Regulation

1(1) In this regulation

(a) "bricklayer" means a person who

(i) lays masonry units of all materials, including all types of stone;

(ii) uses various mortars, units and accessories for bonding in accordance with accepted construction principles for buildings and other structures;

(iii) repairs existing masonry structures;

(iv) lines or relines chimneys, ovens, boilers and other vessels;

(v) lines or relines combustion chambers in fireplaces and furnaces, using all forms and types of refractory units, mortars and castable material;

(b) "General Regulations" means the General Regulations under The Manpower Development Act (Alta. Reg. 43/77) as amended;

(c) "trade" means the trade of bricklayer.

(2) The definitions in the General Regulations apply to this regulation.

PART 1

APPRENTICESHIP AND TRADE TRAINING

2 A person is eligible to be an apprentice in the trade who has satisfied the requirements of section 5 of the General Regulations and has

(a) produced to the satisfaction of the Director evidence that he has acquired at least a grade 9 education or equivalent, or

(b) passed an entrance examination prescribed by the Board.

3(1) Subject to subsection (2), a person engaged in the trade and who employs one journeyman or is himself a journeyman, may employ one apprentice and one additional apprentice for each additional two journeyman employed.

(2) The Director may authorize a person to temporarily employ an apprentice, in addition to those employed under subsection (1), for the purpose of training the apprentice in a branch of the trade not practiced by the person to whom he is apprenticed.

4(1) The term of apprenticeship shall consist of 3 periods of 1600 hours of employment in this trade, exclusive of time spent attending technical courses prescribed by the board.

(2) The Director may not under section 25(1) of the Act, reduce the term of apprenticeship to be served by an apprentice to less than one period of apprenticeship.

5 When a contract of apprenticeship is registered with the Director, he shall issue a record book to the apprentice pursuant to section 14 of the General Regulations.

6(1) The Director shall make an entry in the apprentice's record book authorizing advancement to the next period, when the apprentice

(a) has completed a period of apprenticeship,

(b) has received, in the opinion of the Director, a satisfactory report from

(i) his employer, and

(ii) a school at which he attended technical training courses prescribed by the board,

and

(c) has

(i) completed the tests and examinations prescribed by the Board, and

(ii) attained pass marks prescribed by the Board in those tests and examinations.

(2) An apprentice shall not advance to the next period until the Director has authorized him to do so by making an entry in the apprentice's record book.

7 The record book of an apprentice shall be kept in the possession of his employer and, upon termination of the employment of the apprentice, shall return the book to the apprentice.

8(1) An employer shall pay wages to the apprentice that are not less than the following percentages of the prevailing wages paid to a journeyman:

(a) 50% in the first period;

(b) 80% in the 2nd period;

(c) 90% in the 3rd period.

(2) Notwithstanding subsection (1), the wages paid to an apprentice shall not be less than the minimum wage fixed pursuant to The Alberta Labour Act, 1973.

(3) An employer is not required to pay an apprentice wages during the time that the apprentice spends attending technical training courses prescribed by the Board.

9 The hours of work and working conditions of an apprentice shall be the same as those of a journeyman.

PART 2

CERTIFICATION

10 In addition to section 32 of the General Regulations, the Director may issue a Certificate of Qualification for the trade without examination to a person who holds

(a) a Certificate of Completion of Apprenticeship in this trade issued by another province or territory within Canada, or

(b) a Certificate of Qualification or a Certificate of Proficiency in this trade issued by another province or territory within Canada bearing an Interprovincial Standards Red Seal.

11(1) An application to take an examination for a Certificate of Qualification shall be made to the Director.

(2) Documentary evidence acceptable to the Director shall be presented by the applicant for an examination showing that the applicant

(a) holds a certificate equivalent to an Alberta Certificate of Qualification issued by a recognized authority outside of Alberta, or

(b) has at least 4 years of acceptable work experience in the trade.

(3) The applicant shall provide English translations acceptable to the Director, of credentials in a foreign language submitted pursuant to subsection (2).

12 Certificates of Qualification issued under these regulations are effective unless cancelled or suspended by the Director in accordance with sections 42 and 43 of the General Regulations.

13 Alberta Regulation 212/68 is repealed.

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